CLAIMS

We claim:

1. A heating element comprising:

a substrate;

a conductive layer disposed over the substrate to define a first conductive trace and a second conductive trace with a spacer therebetween; and

a resistive layer covering the first conductive trace, the second conductive trace and the spacer, wherein the resistive layer at least partially electrically connects the first and the second conductive traces.

2. A heating element according to Claim 1, wherein the resistive layer has a first surface abutting the conductive traces and the spacer, and a second surface opposite the first surface, wherein the second surface is at least substantially planar.

3. A heating element according to Claim 2, wherein each of the conductive traces has a sidewall facing the other conductive trace, the sidewall being at least substantially perpendicular to the first surface of the resistive layer.

4. A heating element according to Claim 1, wherein the spacer is made of the same material as the resistive layer.

5. A heating element according to Claim 1, wherein the spacer comprises an electrically insulating material selected from a group consisting of BPSG, PSG, TEOS, and silicon nitride.

6. A heating element according to Claim 1, wherein the spacer and the conductive traces have respective surfaces abutting the resistive layer, the surfaces being at least substantially coplanar with respect to each other.

7. A heating element according to Claim 6, wherein the surfaces are chemical mechanically polished.

8. A heating element according to Claim 1, wherein the substrate comprises an insulating layer on which the conductive layer is disposed over.

9. A heating element according to Claim 8, wherein the spacer is a protruding part of the insulating layer.

10. A heating element according to Claim 1, wherein the resistive layer is at least substantially uniformly thick.

11. A fluid ejection device comprising:

a substrate;

a conductive layer disposed over the substrate to define a first conductive trace and a second conductive trace with a spacer therebetween;

a resistive layer covering the first conductive trace, the second conductive trace and the spacer, wherein the resistive layer at least partially electrically connects the first and the second conductive traces; and

a barrier layer adjacent the resistive layer that defines a fluid chamber in which fluid may be heated and ejected therefrom.

12. A printhead comprising:

a substrate;

a conductive layer disposed over the substrate to define a first conductive trace and a second conductive trace with a spacer therebetween;

a resistive layer covering the first conductive trace, the second conductive trace and the spacer, wherein the resistive layer at least partially electrically connects the first and the second conductive traces; and

a barrier layer adjacent the resistive layer that defines a firing chamber in which fluid may be heated and ejected therefrom.

13. A print cartridge comprising:

a fluid reservoir; and

a printhead fluidically coupled with the fluid reservoir, wherein the printhead comprises a substrate; a conductive layer disposed over the substrate to define a first conductive trace and a second conductive trace with a spacer therebetween; a resistive layer covering the first conductive trace, the second conductive trace and the spacer, wherein the resistive layer at least partially electrically connects the first and the second conductive traces; and a barrier layer adjacent the resistive layer that defines a firing chamber in which fluid from the reservoir may be heated and ejected therefrom.

14. A method of manufacturing a heating element comprising:

forming a conductive layer to define a first conductive trace and a second conductive trace over a substrate, the first conductive trace being separated from the second conductive trace by a spacer; and

forming a resistive layer on the conductive layer to cover the first conductive trace, the second conductive trace and the spacer, wherein the resistive layer at least partially electrically connects the first conductive trace and the second conductive trace.

15. A method according to Claim 14, wherein forming a conductive layer comprises:

forming a conductive layer on a substrate;

removing a portion of the conductive layer to define the first conductive trace, the second conductive trace and a void therebetween;

filling the void with an electrically insulating material; and

planarizing at least a surface of the electrically insulating material such that the surface is at least substantially coplanar with corresponding surfaces of the conductive traces.

16. A method according to Claim 15, wherein the electrically insulating material is selected from a group of materials consisting of BPSG, PSG, TEOS, and silicon nitride.

17. A method according to Claim 15, wherein planarizing comprises chemical mechanical polishing.

18. A method according to Claim 14, wherein forming a conductive layer comprises:

forming an insulating layer on the substrate;

removing portions of the insulating layer to define a protruding portion flanked by two shoulder portions;

forming a conductive layer on the insulating layer to cover the protruding portion and the shoulder portions; and

planarizing a surface of the conductive layer to expose the protruding portion to thereby separate the first conductive trace from the second conductive trace.

19. A method according to Claim 14, wherein the resistive layer is at least substantially uniformly thick.